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ABSTRACT

This booklet illustrates a number of suggested plans, with the drawings presenting ideas for space arrangement, facilities, and equipment rather than prescribed layouts. In established schools, many of the suggestions may be applied to improve existing arrangements. Room plans are presented for combined woodwork-metalwork and separated woodwork-metalwork. The single room design is presented for schools that require one industrial arts teacher, while the double room design is indicated for larger schools requiring the services of two teachers. (Author/MLF)

ED 085905

Suggestions for Industrial Arts Facilities for Elementary and Secondary Schools

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in conjunction with
the Department's Industrial Arts Committee

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PREFACE

This booklet illustrates a number of suggested plans for industrial arts rooms in both elementary and secondary schools. The drawings present ideas for space arrangement, facilities, and equipment rather than prescribed layouts. In established schools, many of the suggestions may be applied to improve existing arrangements.

Plans and specifications for a room must reflect the philosophy of the program that will be carried on in that room.

Industrial arts is designed to give the students a wide range of experiences in, and an appreciation of, the elements of modern technology. These elements range from the free expression of crafts and design to the precise demands of electronics and machine work.

The program will be broad enough to stimulate experimentation in diverse areas, but will also allow a depth of study that may be necessary to satisfy a student's needs and interests.

Consistent with these ideas, industrial arts rooms must provide flexibility which may be achieved by:
—using multi-purpose equipment that serve more than one specialized function.
—providing a wide variety of equipment
—installing movable benches
—providing an underfloor electrical duct system to allow a flexible arrangement of machines.

It is important to remember that, while students work with materials and construct projects and models, the program's function is to promote understanding and to stimulate creativity.

A resource area where students can do research and planning is a necessity. A separate room where dust and sound can be controlled is desirable; but the same function can be performed within the main room.

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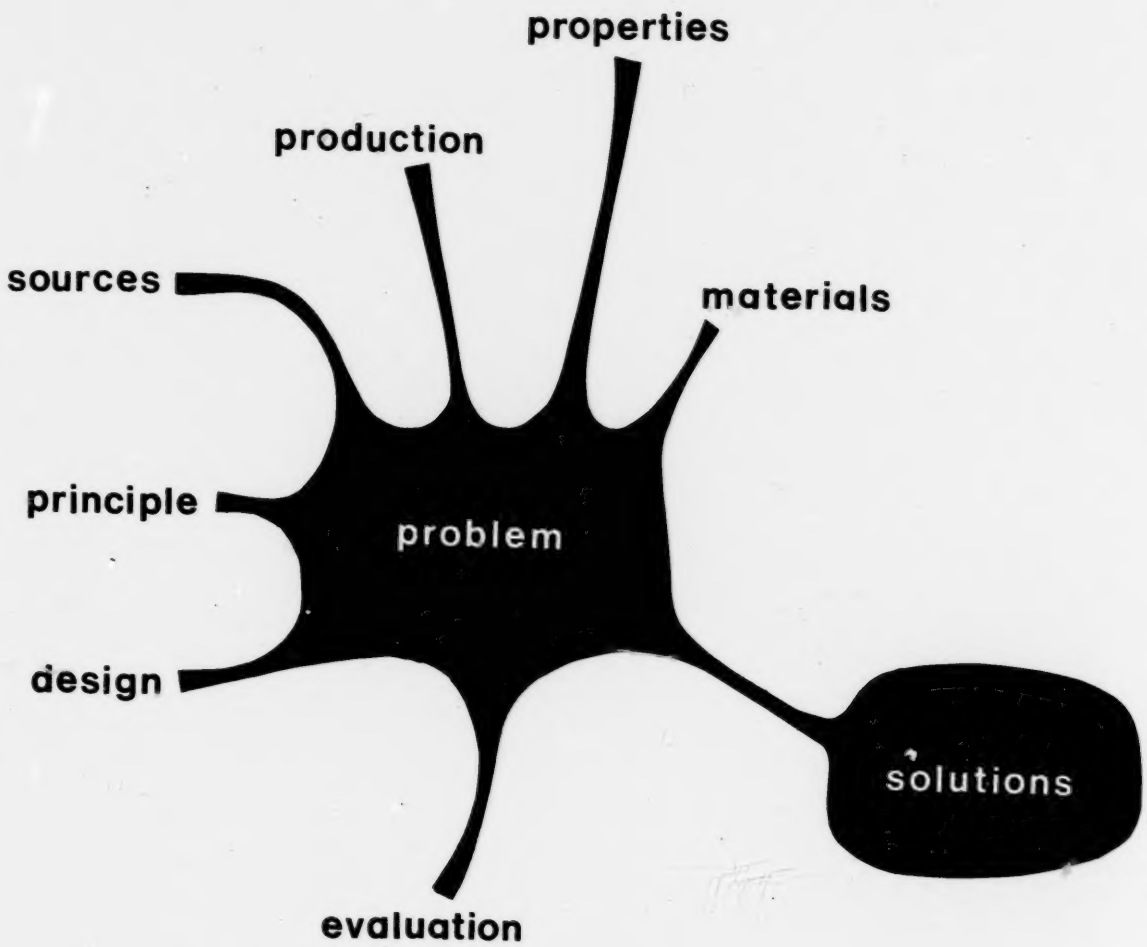
INDUSTRIAL ARTS ENVIRONMENT



FUNCTION

While the industrial arts program is committed to the aims of general education, it does provide unique opportunities for students to:

—discover and apply the useful properties of materials, both traditional and newly developed

—study and experiment with the application of scientific principles

—understand the inter-relation of the arts, sciences, and technology

—appreciate the importance of technology in our society.

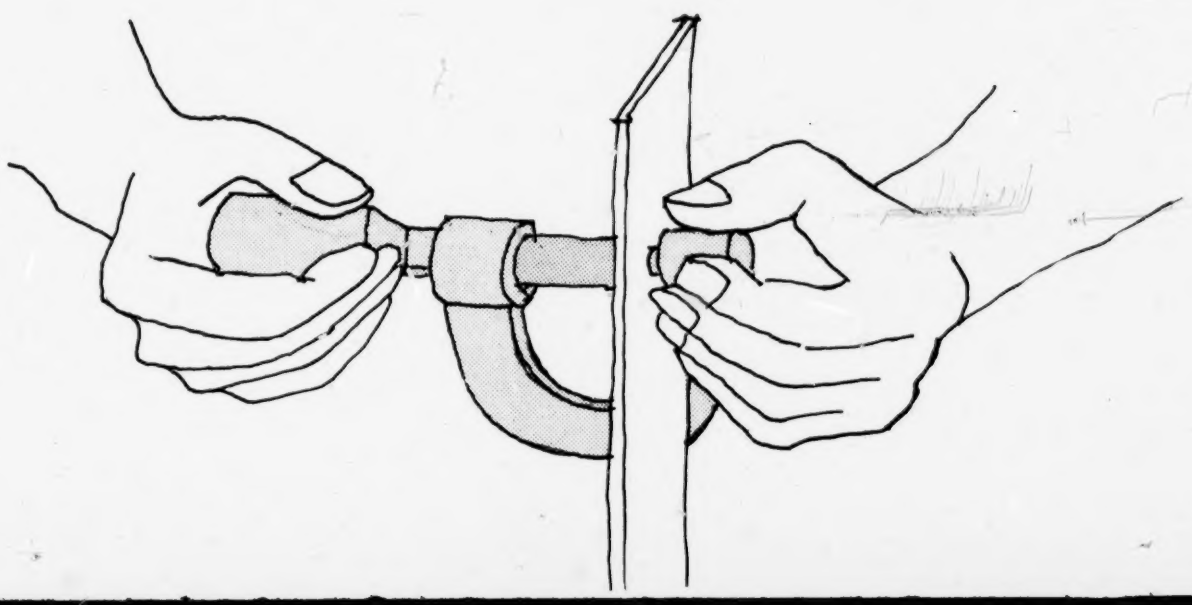
LOCATION

Grade level with outside service entrance.

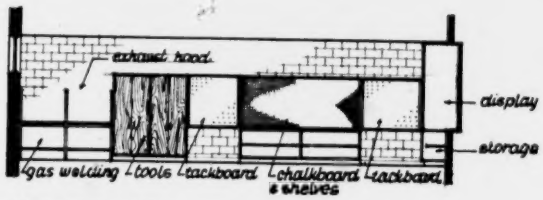
FACILITIES

Two types of room-plans are presented in this brochure. The single room is designed for schools that require one industrial arts teacher. The double room is for larger schools requiring the services of two teachers.

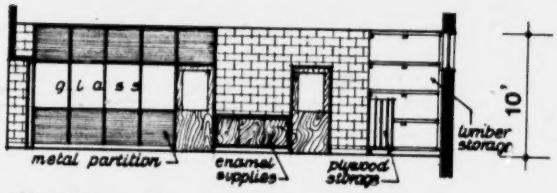
The same activities are carried on in each type of room. More work areas for each activity can be provided in the double room. However, to avoid unnecessary duplication of equipment, associated activities have been grouped together.



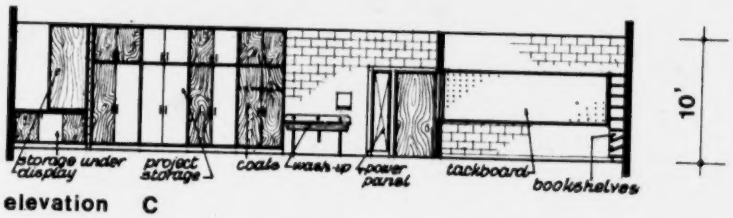
Drawing 1 – Combined Woodwork-Metalwork (grades 7-9)



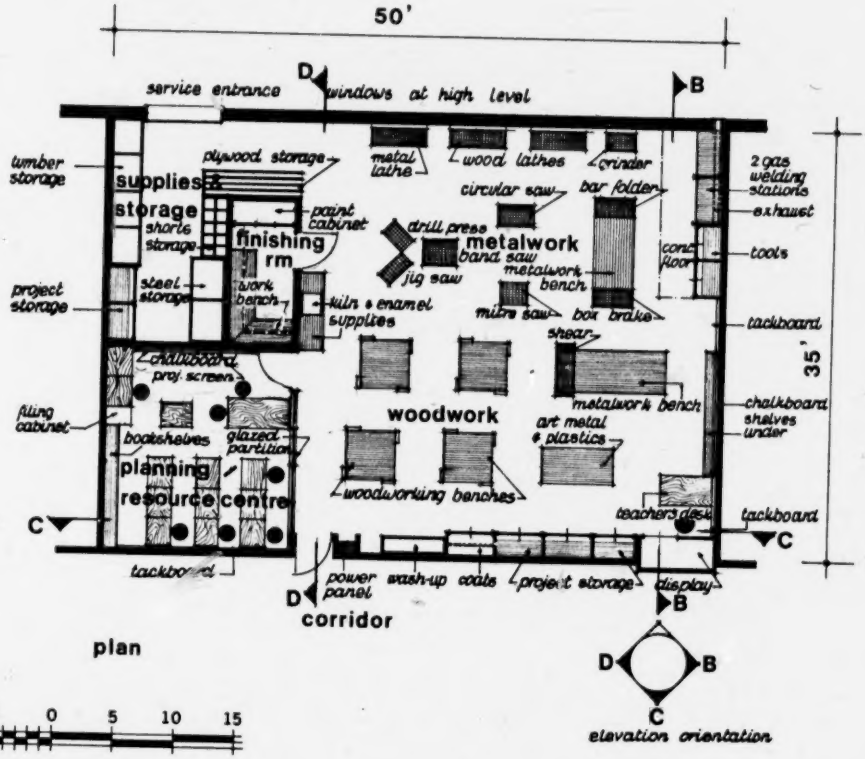
elevation B



elevation D

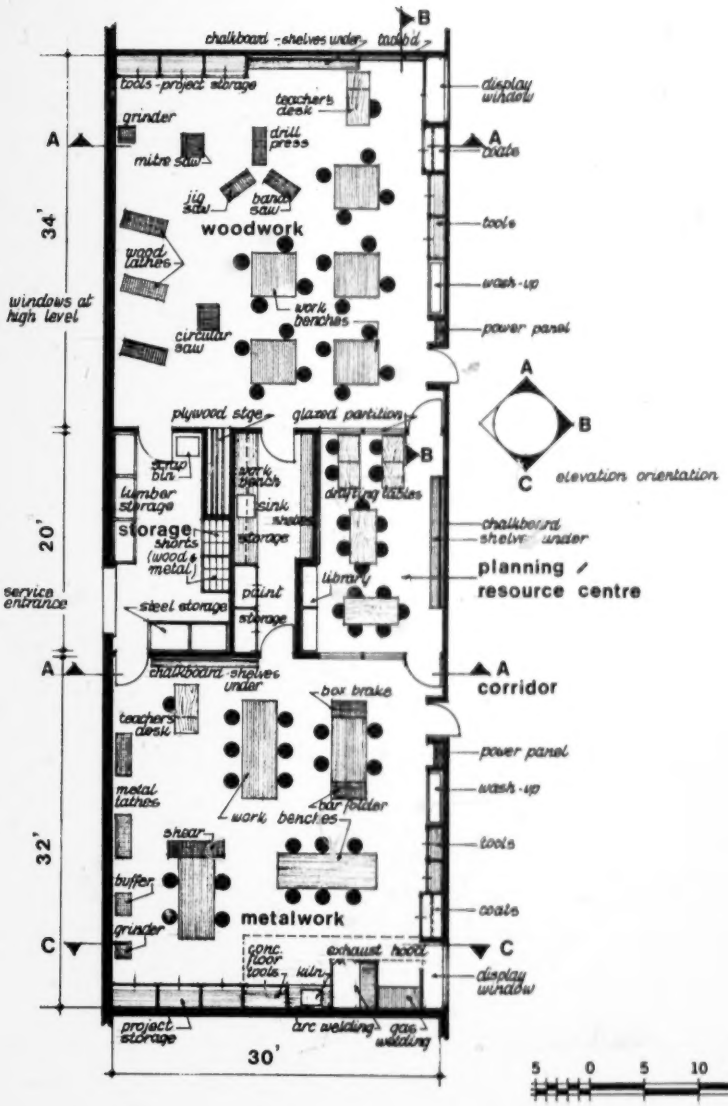


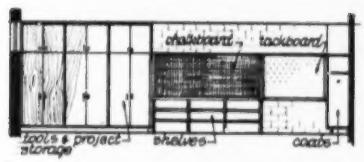
elevation C



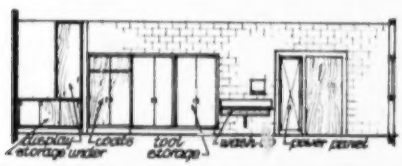
Drawing 1 is a room that can accommodate a maximum of twenty classes each of sixteen to twenty students assuming 1½ hours for each class every week. It contains a variety of equipment, but does not require a large amount of any one kind.

Drawing 2 – Separated Woodwork-Metalwork (grades 7-9)

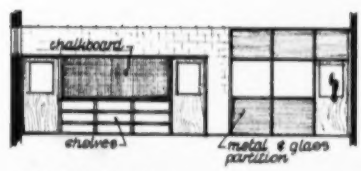




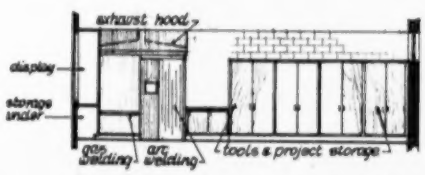
elevation A



elevation B woodwork shop



elevation A

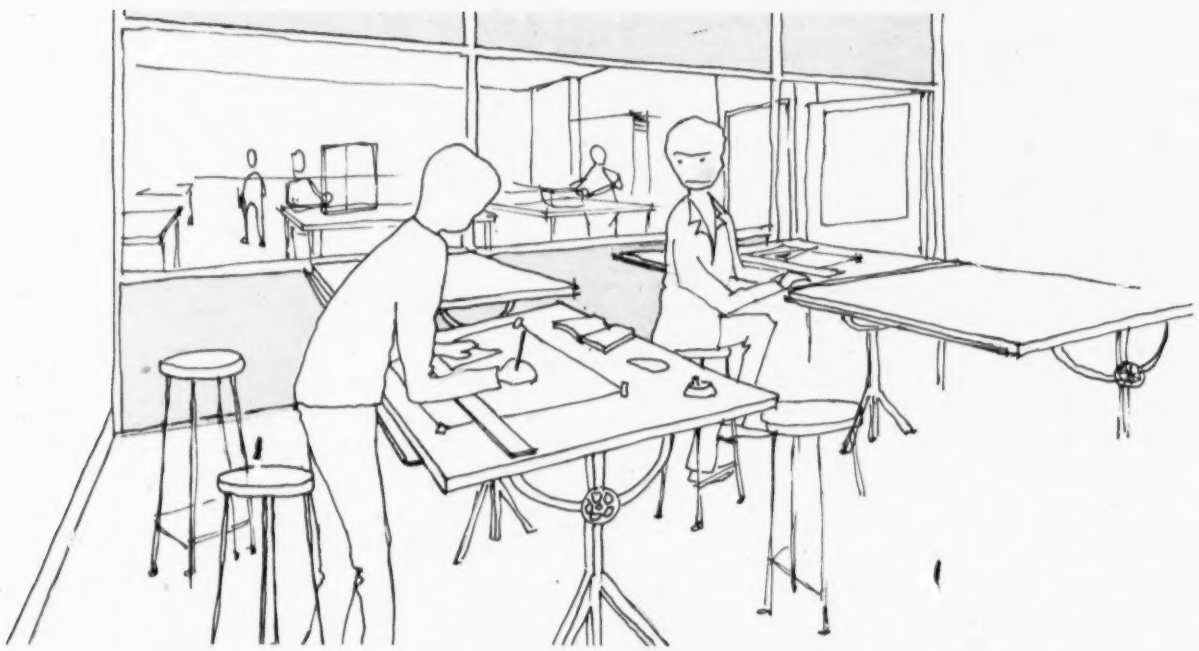


elevation C metalwork shop

Drawing 2 illustrates accommodation for forty classes. The storage area, paint room, and resource centre are shared. Although it contains the same type of equipment as the single room, each will require more individual tools and work areas.

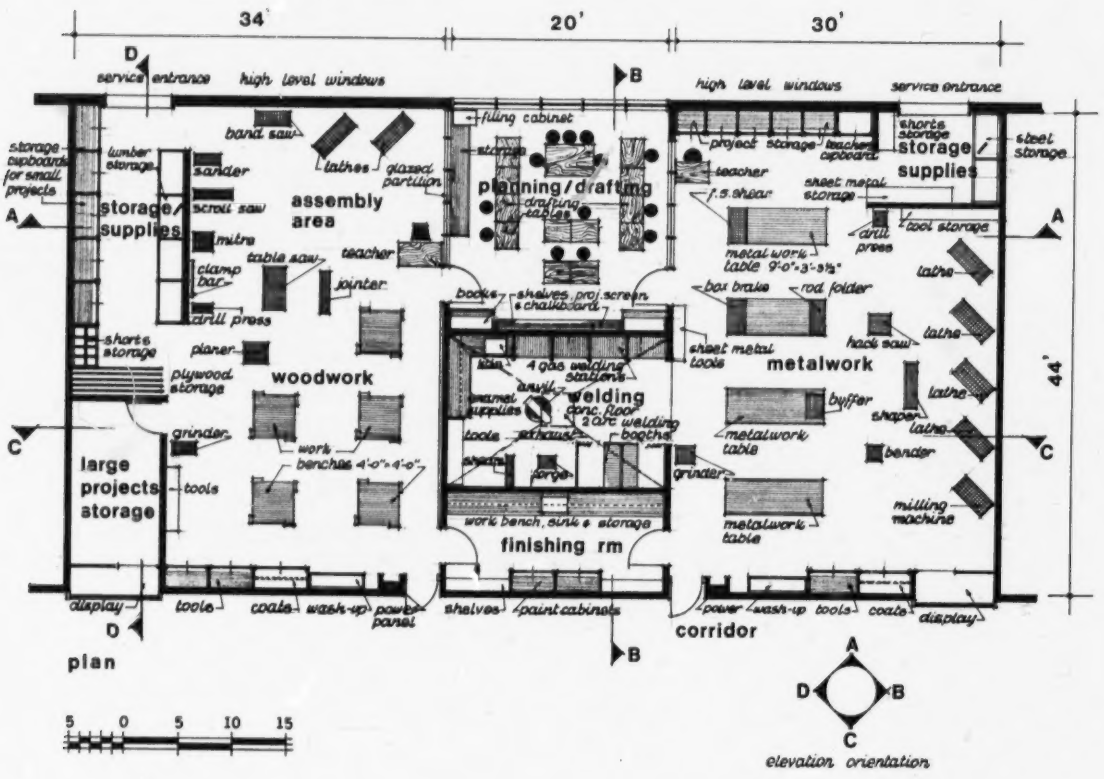
Planning and Resource Area

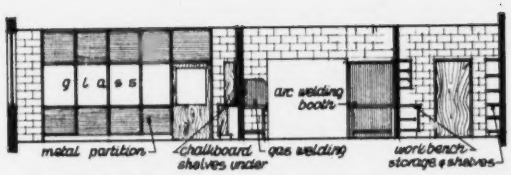
The size and shape of the planning and resource centre will be governed by the overall room size and shape. Provision for soundproofing and dustproofing is desirable. Partitions should be glazed for maximum view to the main room. This area should provide for: library and resource materials, drawing tables, audiovisual equipment, screen, blackboard and tackboard.



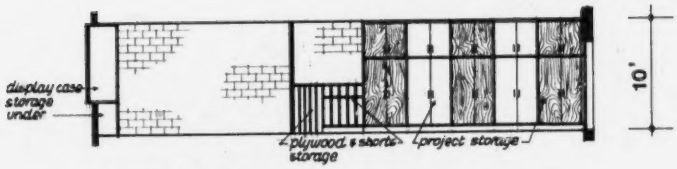
Drawing 3 – Separated Woodwork-Metalwork (grades 9-12)

Drawings 3 on this page and 5B on page 15, apply to secondary schools that will need facilities for about twenty classes and for two teachers of industrial arts. In Plan 3 below, finishing room and resource area are shared, while the storage areas are separate. In Drawing 5B resource, finishing and storage facilities are shared by both rooms.

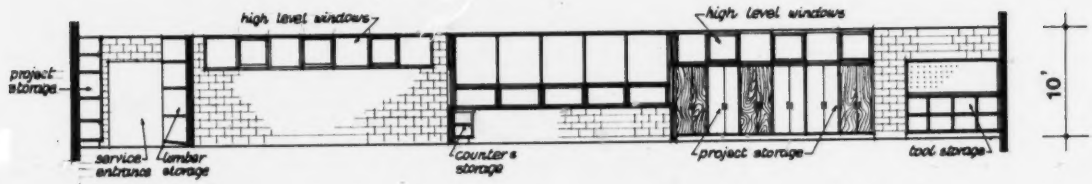




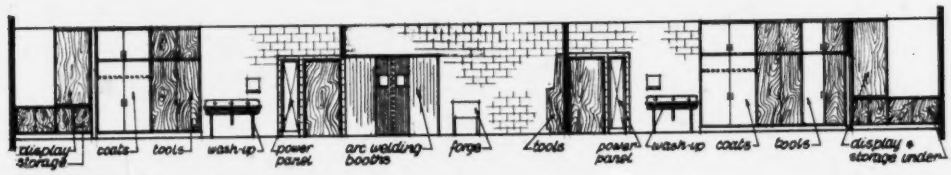
elevation B



elevation D



elevation A



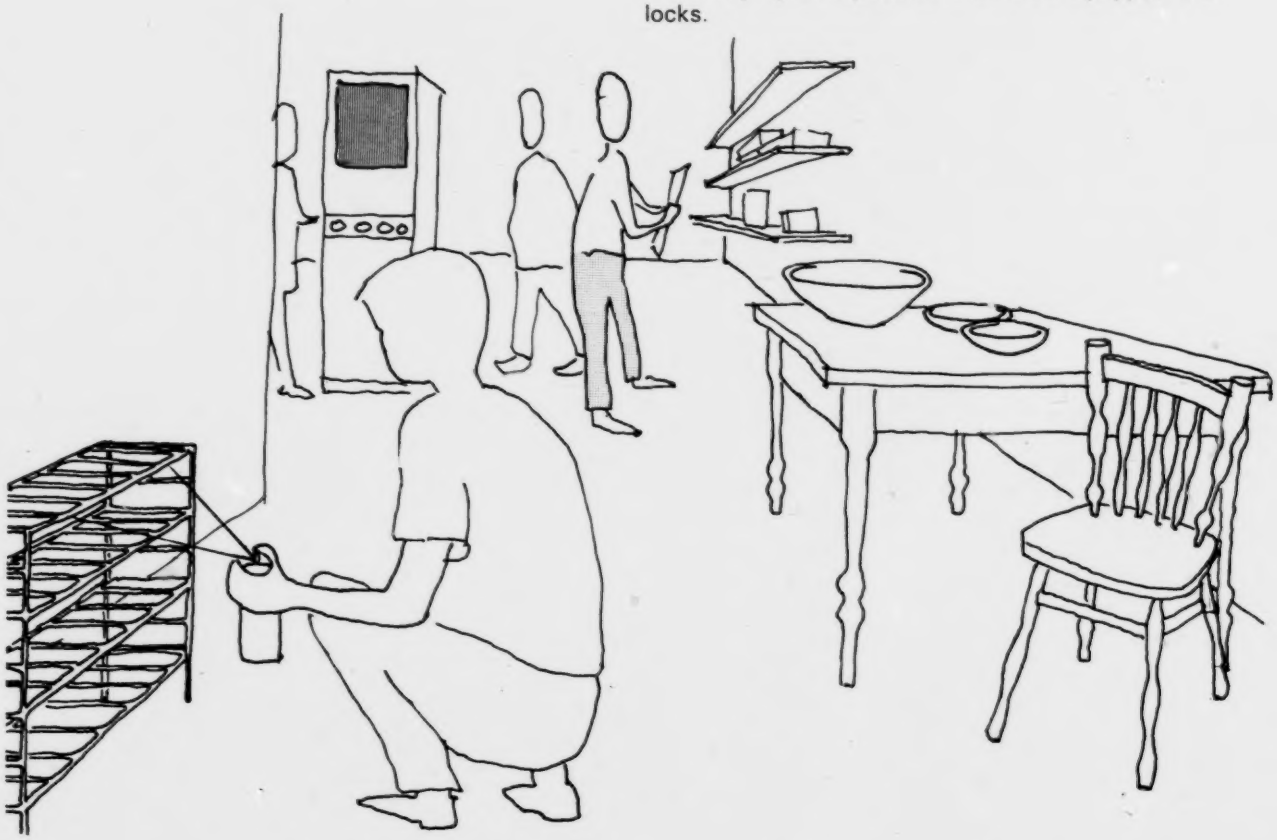
elevation C

Finishing Room

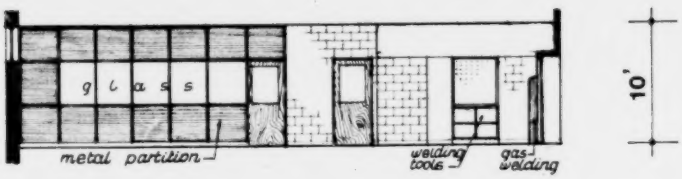
This space should contain an effective exhaust system, steel supply cupboards and rack for storage.

Storage

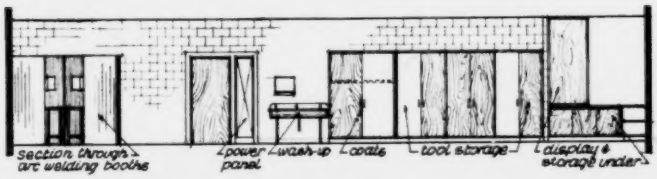
The amount and type of storage areas will depend on the number of pupils and whether the school is elementary or secondary. Careful planning of the storage areas is necessary to ensure the safe and efficient use of material and an orderly traffic flow. Open storage of small tools, located as close as possible to the work area, may be considered. Student project cupboards should be equipped with locks.



Drawing 4 - Combined Woodwork-Metalwork (grades 9-12)

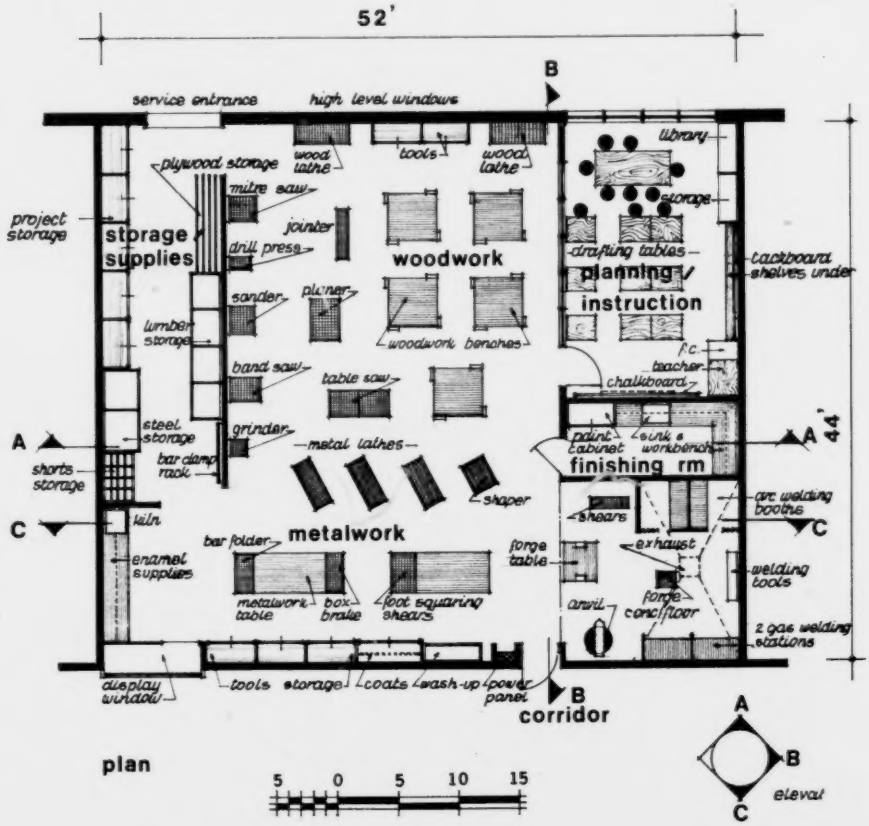


elevation B



elevation C

elevation A



Plans 4 and 5A on pages 13 and 15 show one-teacher rooms that can accommodate about ten classes per week. These rooms are larger than the elementary rooms since they will require more storage space and a wider variety of machines and equipment. If evening classes are to use these rooms, additional storage space may be required.

SERVICES

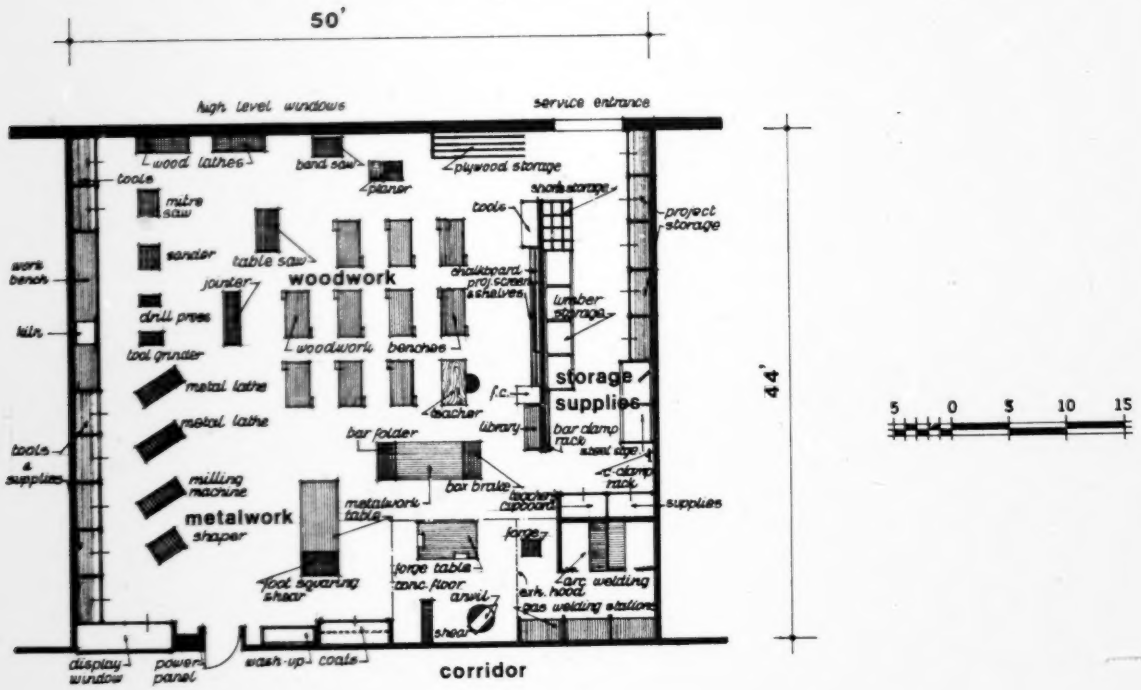
Electrical
A distribution panel, 200-amp, three-phase, 120/208-v, four-wire system, located in the room should contain a keyed, on/off control indicator light and an emergency stop button. Several emergency buttons should be spaced throughout the room as well as circuit breakers for each machine. Electrical outlets of 120v are required close to work areas for portable power tools; switch controlled from the power panel. Machines should be equipped with magnetic switches and be panel controlled. Lighting must provide adequate illumination as recommended by the Canadian National Building Code.

Natural Gas
If available, natural gas should be installed for use with the forge.

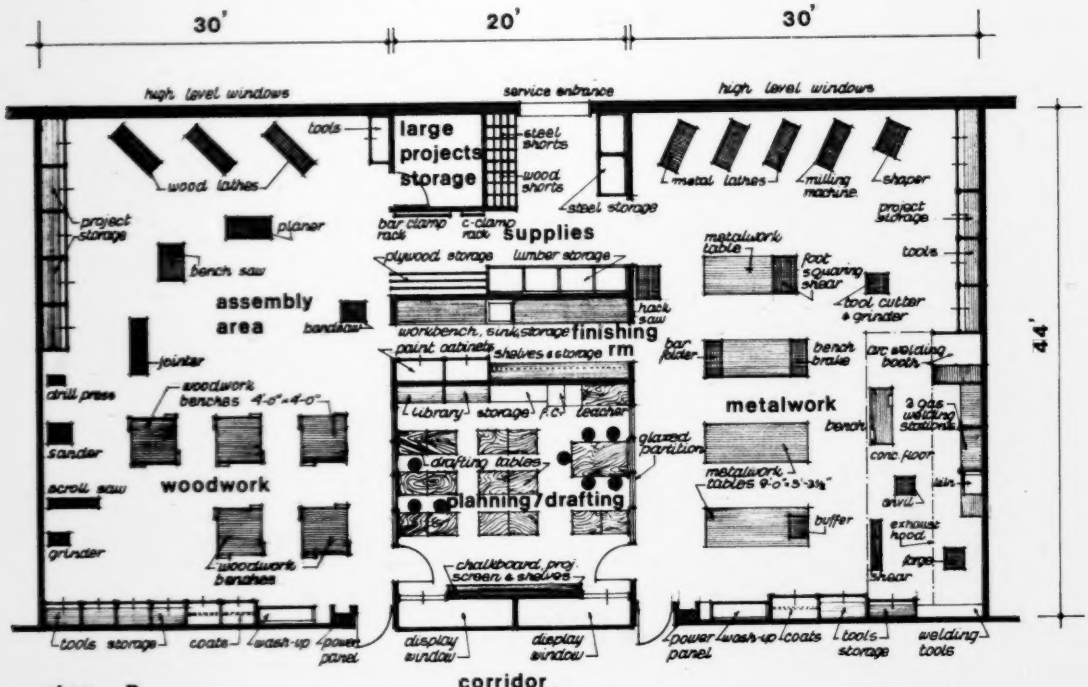
Water
Both hot and cold water connections are necessary for washing facilities.

Finishes
Acoustical material on the ceiling will reduce the noise level in the room. Wood, pressed wood tile, or resilient tile on concrete floors is advisable. Special areas such as welding will require some type of hardened surface. Conventional wall materials are suitable if they are finished with a durable, easy-to-maintain coating.

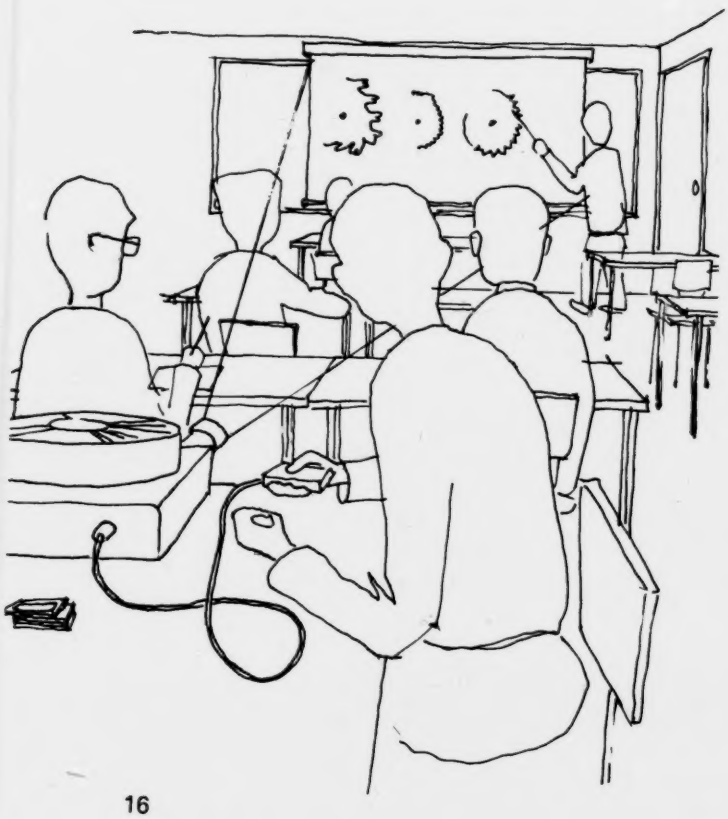
Drawing 5 – Plan A: Combined Woodwork-Metalwork (grades 9-12) – Plan B: Separated Woodwork-Metalwork



plan A



plan B



Safety and Health

Adequate, and separate, exhaust systems for:
—general area
—finishing room

Overhead exhaust collection is needed for locations involving volatile and toxic fumes from:
—reinforced plastics
—welding and soldering
—chemical mixing areas for plastic

A dust collection system is recommended for areas containing dust-producing machines such as saws and planers. The duct system may be installed under the floor, with the collector fan and bin located outside the building. A special floor suction vent may be connected to the ducts for sawdust sweepings.

Portable dust collectors may be considered as an alternative to the complete duct system.

General Equipment

Wherever possible furniture should be adaptable to more than one function. For example, metal-topped benches, designed for metal work, could be employed for gluing, plastic technology and wood lamination. Drafting tables in groups of four or more would be ideal for conferences. Specialized benches for portable power tools, soldering, and basic electricity should be provided with electrical outlets, preferably switch controlled from the power panel for safety.

Tools and Equipment

No attempt has been made to list the various hand tools that form an integral part of an industrial arts room. The purchaser, in deciding upon hand tool equipment, should keep the following in mind:
—quantities of any one type of tool should be sufficient to supply six to eight boys at one time.
—tools should be stacked in a variety of sizes, designs and types to make possible many acceptable solutions to a particular problem; for example, four or more clamp styles are more desirable than a great many of one particular style.